# Engine Simulator for Control Panel

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*Abstract:Now days the simulation and testing of panels is done manually. Panels are customized as per client/customer's requirement. There is also requirement for third party inspection. The control panels for various applications like DG set, main engine, compressors; AC plant etc. testing is needed.*

*In this project the testing is done by using Controller. The TEST procedure is done by just one push. Once the simulation is started all the parameters of panel are tested. The signals are generated for testing of panel.*

*Keywords: Controller, Lube oil pressure, temperature, motor speed monitoring.*

## I.    INTRODUCTION

An engine simulator is designed for controlling the on-field panel; to check its parameters, whether the panel satisfy the conditions or not. Earlier testing of control panel is done manually. On start button the panel gets started and simulation of it begins. For starting of engine one needs to develop the pressure and as the pressure starts to develop testing gets started. For testing the control panel engine parameters used and measured.

In this project, engine part is eliminated and the parameters required for testing is developed by controller along with 4-20mAmp generator and voltage to frequency convertor which is used for testing the motor speed. The major parameters to be checked are lube oil pressure, motor speed, lube oil temperature and water temperature.

## II.    SYSTEM MODEL

This project is developed by using a microcontroller which is responsible for generating the signals for control panel testing. While testing first pressure is needed to develop that is done by using AD420 which develop the 4-20mAmp current with respect to pressure. As pressure starts to develop motor speed is varied for this VFC32 that is voltage to frequency convertor is used which generates frequency signal from 0-100KHz.

On Start button pressure starts to develop and for checking the lube oil pressure within the control panel other push button is provided once the pressure is reached to set point then it will trip and pressure will become constant. And this procedure is repeated for other parameters on single push. Fig 2.1 shows the basic block diagram engine simulator.
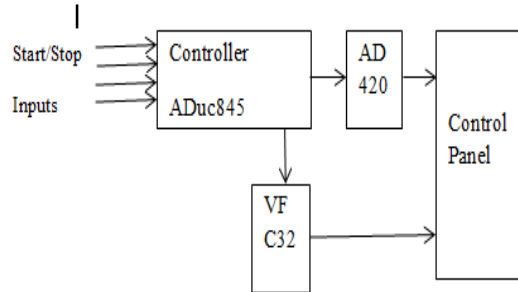


Fig 2.1 Basic Engine Simulator for Control Panel

## III.    METHODOLOGY

Fig 3.1 shows the flow of the system. It starts with start button and with this pressure testing is done; as speed is directly proportional to the pressure it starts to increase with increase in pressure. A particular set point is given for each parameter to be tested.
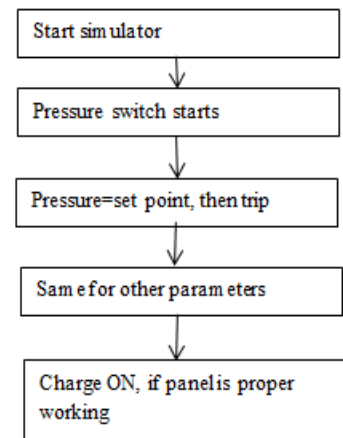


Fig 3.1 Flow chart for simulator

## IV.    RESULTS

The result obtained from this project is nothing but the frequency signal of 0-100KHz and 4-20mAmp current that is standard signal used for any process in industry.



Fig 4.1 Schematic of panel

Fig. 4.2 Simulator for control panel

## V. CONCLUSION

In this project the testing is done by using controller. The TEST procedure is inbuilt into the panel and the same panel can be used for all the ranges or types of control panel. The testing is fully automated once the system is started.